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PCB TRANSFORMER COMPLIANCE PROJECT

Consent Decree Cleanup Plan

File No. 5385

November 1997

Prepared for:

The School District of Philadelphia
Philadelphia, Pennsylvania

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1.0 INTRODUCTION

This Cleanup Plan has been prepared as a requirement of the Consent Decree between the United States Environmental Protection Agency and The School District of Philadelphia (Section V, Paragraph 8.a). This Cleanup Plan describes the methods which will be used for removal, cleaning and decontamination, or encapsulation of PCB contaminated surfaces. Additionally, this document describes the plan for the disposal of all PCB wastes generated during the implementation of this Cleanup Plan.

1.1 Cleanup Plan Criteria

This Plan has been developed to satisfy the cleanup criteria contained in Section V, Paragraph 8.a and 8.b of the Consent Decree. The cleanup criteria is summarized below.

1. Any metal or concrete surfaces at the facilities which have been identified as containing more than 10 $\mu g/100cm^2$ will be cleaned and decontaminated in accordance with 40 CFR § 761.125 or removed and disposed of in accordance with 40 CFR § 761.70 or 40 CFR 761.75.

2. Low contact indoor non-impervious surfaces (i.e., concrete) may be cleaned either to 10 $\mu g/100\ cm^2$ or to 100 $\mu g/100\ cm^2$ and encapsulated in accordance with 40 CFR § 761.125. However, if surfaces can not be cleaned to 100 $\mu g/100cm^2$, The School District may propose encapsulation as an interim measure.

3. If The School District proposes to utilize encapsulation for any non-impervious surfaces, The School District must incorporate appropriate means to ensure that persons are not exposed to PCB contamination, that the contamination is not spread, and to ensure that encapsulated materials will be disposed of as soon as possible. The removal and disposal of contaminated materials at any School District facility is to take place not later than the time that the PCB transformers at any School District facility are permanently removed or when demolition or renovation occurs that disturbs the contaminated material. However, removal of encapsulated materials need not occur if removal is not feasible due to structural engineering concerns. In the event that encapsulated materials are not removed, a deed notification shall be filed by The School District as described within the Consent Decree.

4. The Cleanup Plan is to be completed within 60 days of USEPA's approval of the Plan.

2.0 BACKGROUND

2.1 Inventory of PCB Transformers

Table 2-1 provides an inventory of the original 31 School District owned PCB transformers which were located at 13 separate School District facilities. It is noted that the Central East Middle School transformer was removed on 26 June 1997, and the Hackett Elementary School and Randolph Skills Center transformers were removed on 9 and 10 July 1997. As of the date of this plan, the inventory of School District owned PCB transformers has been reduced to 28 transformers at 10 facilities.

2.2 Transformer Inspections

All School District owned PCB transformers have been the subject of an intense visual inspection to determine those units which have leaked dielectric fluids. In accordance with The School District of Philadelphia's PCB Management Plan, all School District owned PCB transformers are inspected on a weekly basis.

Based upon the initial inspections and dielectric fluid testing which was performed, leaks of PCB dielectric fluid were observed from one or more of the transformers at the following nine locations:

- Strawberry Mansion High School
- Wanamaker Middle School
- Girls High School
- Northeast High School
- Overbrook High School
- Randolph Skills Center
- South Philadelphia High School
- Central East Middle School
- Roxborough High School

All leaks of dielectric fluids from these transformers have been repaired, and appropriate sampling and remedial measures have been implemented as discussed in Section 2.3.

2.3 Pre-Clean Up Sampling Reports

As required by the Consent Decree, an individual Pre-Cleanup Sampling Report has been submitted to the USEPA for each facility where a confirmed release of PCB dielectric fluid occurred. Each report provided a description of the following:

- The surfaces which were cleaned (as appropriate, the transformer casing, surrounding floor area, and/or substation walls), the cleaning method utilized, and the number of rounds of cleaning which were performed.

- The wipe sampling which was performed after the cleaning was completed. This wipe sampling was performed on the transformer casing, floors, and at some locations on substation walls.

- The analytical data from the wipe sampling, including laboratory data sheets, chain of custody forms, and quality assurance/quality control procedures which were utilized.

- An assessment of the analytical results, with particular emphasis on the observed decrease in PCB concentrations as a result of the cleaning activities.

- Conclusions and recommendations for each location.

In general, the pre-cleanup sampling plans have shown that:

- The metal surfaces of the transformer casings can be effectively cleaned to a PCB surface concentration of 10 $\mu g/100\ cm^2$ or less.

- At a number of facilities, portions of the concrete floor which have been impacted by past leakage from the PCB transformers can not be effectively cleaned to achieve a PCB surface concentration of 100 $\mu g/100\ cm^2$ or less. It has been concluded that further cleaning would not be expected to reduce the surface concentration to the stipulated "no-action" level of 10 $\mu g/100 cm^2$.

- At most facilities, adequate wipe sampling of floor surfaces have been performed to identify the extent (boundaries) of the floor surface areas which have PCB wipe sample concentrations in excess of 10 $\mu g/100\ cm^2$. As described within Section 3.0 of this Cleanup Plan, at locations where full delineation of the "no-action" boundary has not been determined, additional sampling will be performed as part of the Cleanup Plan.

The School District has determined that at most locations, the removal of PCB contaminated concrete (i.e., concrete surfaces which exhibit a PCB concentration in excess of 10 $\mu g /100\ cm^2$) is not feasible at the present time. Removal of PCB contaminated concrete may be possible at the time that PCB transformers are permanently removed from service. The School District intends to replace all School District owned PCB transformers within the next few years. Prior to the removal of a PCB transformer, an evaluation of the feasibility of removing PCB contaminated concrete will be performed.

The Pre-Cleanup Sampling Reports have proposed that PCB impacted areas which can not be remediated using the methods employed to date, be encapsulated with a two-part epoxy coating system. A properly applied two-part epoxy coating system will ensure that persons are not exposed to PCB contamination and that the contamination will not spread. It is noted however, that The School District intends to evaluate, on a site specific basis, the installation of a "new" concrete floor which would be installed directly above the PCB contaminated concrete floor. This new concrete floor would ensure that persons are not exposed to PCB contamination and that contamination will not spread. It is anticipated that this remedial measure would be evaluated for those locations where PCB levels in wipe samples exceed the cleanup criteria in essentially the entire transformer room or enclosure. This method has been proposed by The School District and approved by USEPA for the Randolph Skills Center. The evaluation of alternatives for this location as well as USEPA's letter of approval are provided in Appendix A.

The remaining sections of this Cleanup Plan describe the following:

1. The additional floor wipe sampling which will be performed prior to the encapsulation or removal of concrete.

2. The engineering design, product specification, and application procedures to be utilized for the encapsulant.

3. The approach to be utilized for the removal and disposal of concrete.

4. The inspection and maintenance plan to be implemented to ensure the continued integrity of the encapsulated surfaces.

5. The anticipated means for disposal of waste products generated during the implementation of this cleanup plan.

Table 2-1
The School District of Philadelphia
Inventory of School District Owned PCB Transformers
as of December 31, 1996

School	Inventory of PCB Transformers			Fluid (nameplate data)		
	Number of Units	Serial Number	Manufacturer	Tradename	Volume (gallons)	Weight (pounds)
Strawberry Mansion High School	2	3475167	Allis Chalmers	Chloroextol	225	3,313
		3475168	Allis Chalmers	Chloroextol	225	3,313
Roxborough High School	4	106626	Federal Pacific Electric Co.	Askarel	175	2,275
		106627	Federal Pacific Electric Co.	Askarel	175	2,275
		106628	Federal Pacific Electric Co.	Askarel	175	2,275
		106629	Federal Pacific Electric Co.	Askarel	175	2,275
Old Clemente (aux. transformer - see note 2)	2	6024406*	General Electric Co.	Transil oil	3.5	unknown
		6024445	General Electric Co.	Transil oil	3.5	unknown
Overbrook High School	3	87600	Marcus Transformer Co.	Askarel	147	1,910
		87601	Marcus Transformer Co.	Askarel	147	1,910
		87602	Marcus Transformer Co.	Askarel	147	1,910
Northeast High School	6	32641-1	PA Transformer Co.	Askarel	433	5,600
		32642-1	PA Transformer Co.	Askarel	433	5,600
		32639-1	PA Transformer Co.	Askarel	335	4,400
		32640-1	PA Transformer Co.	Askarel	335	4,400
		32639-2	PA Transformer Co.	Askarel	335	4,400
		32640-2	PA Transformer Co.	Askarel	335	4,400
South Philadelphia High School	2	31398-1	PA Transformer Co.	Askarel	618	8,050
		31399-1	PA Transformer Co.	Askarel	618	8,050
Benjamin Franklin High School	2	C858009	General Electric Co.	Pyranol	810	10,600
		C858010	General Electric Co.	Pyranol	810	10,600
Girls High School	4	6534822	Westinghouse Electric Co.	Interteen	493	6,400
		6534823	Westinghouse Electric Co.	Interteen	493	6,400
		6367219	Westinghouse Electric Co.	Interteen	366	4,750
		6367220	Westinghouse Electric Co.	Interteen	366	4,750
Central East Middle Sch. (Olney Annex) - see note 3	1	E692327	General Electric Co.	Pyranol	250	3,250
Randolph Skills Center - see note 3	1	8976949	General Electric Co.	Pyranol	520	6,800
Wanamaker Middle School	1	6537493	Westinghouse Electric Co.	Interteen	419	5,450
Hackett Elementary School - see note 3	1	YCR-92501	Westinghouse Electric Co.	Interteen	216	2,800
George Washington High School	2	3338913	Allis Chalmers	Chlorextol	342	4,445
		3338914	Allis Chalmers	Chlorextol	342	4,445
Total	*31*				*10,467*	*137,046*

Notes:

1. Only PCB transformers are listed (i.e., dielectric fluid containing >500 ppm PCBs). Transformer classification is based upon either nameplate data or sampling and analysis of dielectric fluid.
2. One of the two transformers is not on-line, but is considered as being stored for reuse.
3. These transformers are scheduled for removal prior to September 1997.

* The mesured concentration of PCB in this device is 480 ppm, and is technically not a PCB transformer. It is listed here for inventory purposes only.

3.0 Additional Pre-Cleanup Sampling

3.1 Areas Requiring Further Delineation

As previously indicated, at most facilities, adequate wipe sampling of floor, transformer, and wall surfaces has been performed to identify areas which have PCB wipe sample concentrations in excess of 10 µg /100 cm^2. The following describes (1) the additional delineation sampling or cleaning which will be performed prior to removal or encapsulation of any floor or wall surface, and (2) the additional delineation sampling or cleaning which will be performed on the transformer casings.

3.1.1 Floor Areas

Except in isolated areas, The School District's pre-cleanup sampling activities identified the horizontal extent of floor areas where encapsulation is necessary to achieve the PCB wipe sample criteria of 10 µg /100 cm^2. However, as noted in the Pre-Cleanup Sampling Reports, full delineation of the "no-action" boundary has not been determined at the following specified locations at the time that these reports were submitted:

- Randolph Skills Center: Spill Area #2 and in the vicinity of the northwest doorway.
- Central East Middle School: The stained area to the north and east of the transformer and proximate to the concrete at the double door.
- South Philadelphia High School: The spill areas immediately adjacent to the transformers.
- Wanamaker Middle School: At the emergency exit doorway.
- Overbrook High School: The area immediately outside of the curbed transformer enclosure area.
- Roxborough High School enclosure area: A single area to the south of the curbed transformer
- Northeast High School: Horizontally from the spill areas within each of the three substations.

Additional delineation sampling at the above locations within these facilities will be conducted as part of the Cleanup activities.

3.1.2 Transformer Casings

The School District's pre-cleanup sampling activities included the wipe sampling of the metallic casing of all PCB transformers which had identified leaks except for the electrical transformers at Overbrook High School[1]. Sampling was performed on or proximate to leak impacted areas where a "flat" 100 cm^2 surface existed. Except as noted below, all transformer casing wipe sample analytical results yielded a PCB surface concentration which was equal to or less than 10 µg /100 cm^2.

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[1] Wipe sampling of the transformers at Overbrook High School will be performed simultaneously with the floor area delineation sampling.

- Northeast High School — Transformer 32640-1 in Substation 3.
- S. Philadelphia High School — Transformers 31398-1 and 31399-1.
- Strawberry Mansion HS — Confirmatory post-cleanup wipe sampling is required at Transformer 3475168.

As part of the cleanup activities, additional cleaning, followed by confirmatory sampling, will be conducted on the transformer casings listed above at Northeast High School and South Philadelphia High School. It is anticipated that further cleaning of the transformer casings will result in a surface PCB concentration equal to or less than 10 μg /100 cm^2.

Confirmatory PCB wipe sampling only will be conducted on the transformer at Strawberry Mansion High School, at the area which was previously cleaned. A decision regarding further cleaning of this transformer will be made pending receipt and review of the wipe sampling analytical results.

3.1.3 Wall Areas

The School District initiated pre-cleanup sampling activities prior to the USEPA's development of a draft consent decree. Upon receipt and approval of the draft consent decree, the sampling of solid walls within transformers rooms was initiated.

No wall sampling was completed as part of the pre-cleanup sampling performed at the following schools: Randolph Skills Center; Strawberry Mansion High School; Girls High School; South Philadelphia High School; Wanamaker Middle School.

Wipe sampling of the walls within the transformer rooms at Central East Middle School, Overbrook High School, and Roxborough High School showed that the wall areas tested exhibited a PCB concentration of 10 μg /100 cm^2 or less.

Wipe sampling of the walls within the electrical substations at Northeast High School indicated that in each room, an area was identified which exceeded the 10 μg /100 cm^2 or less PCB criteria.

As part of the Cleanup Plan, a PCB wipe sample will be analyzed from each wall within the impacted transformer rooms at the following locations: Randolph Skills Center; Strawberry Mansion High School; Girls High School; South Philadelphia High School; Wanamaker Middle School. Additionally, further sampling will be conducted at the electrical substations within Northeast High School, proximate to the areas which have been previously identified as exceeding the specified PCB cleanup criteria of 10 μg /100 cm^2.

3.2 Wipe Sampling Procedure

Compliance with the cleanup criteria of the Consent Decree requires that wipe sampling be performed. All wipe sampling performed will be conducted in accordance with the procedures described in Appendix B. All analysis of wipe samples will be performed by a certified laboratory.

4.0 ENCAPSULATION

The School District intends to encapsulate concrete floor surfaces which have a PCB surface concentration in excess of 10 µg/100 cm^2. The School District has evaluated the possibility of removing contaminated concrete floors from facilities where PCB transformers were replaced during the summer of 1997. Based upon structural considerations, it has been determined that the contaminated concrete could not be removed from Central East Middle School or the Randolph Skills Center.

4.1 Concrete Floor Surfaces - Remediation

The concrete floor encapsulant, when properly applied and maintained, is intended to ensure that persons are not exposed to PCB contamination and to ensure that PCB contamination is not spread.

The encapsulant will be applied to concrete floors which exhibit a PCB concentration in excess of 10 µg/100 cm^2, as determined by delineation wipe sampling. Prior to the application of the encapsulant, the area(s) to be encapsulated will be marked, based upon the interpretation of wipe sample results with PCB concentrations of less than or equal to 10 µg/100 cm^2.

In accordance with the requirements of the Consent Decree, the encapsulated contaminated concrete will be removed and properly disposed of at the time that the PCB transformer(s) at each facility are removed from service. The decision regarding the ability or inability to remove encapsulated concrete flooring will be based upon The School District's analysis of structural conditions.

As discussed in Section 2.3, The School District may elect to install a new concrete floor over the existing PCB contaminated concrete, particularly at locations where large areas of the floor exhibit post-cleaning PCB wipe results in excess of 10 µg/100 cm^2. A new concrete floor would be equally protective as a floor which has been encapsulated with an epoxy. In addition, in comparison to an epoxy covered floor, the new concrete floor would be significantly more resistant to deterioration.

Based upon the results of the Pre-Clean Up Sampling Reports, the limited encapsulation of floor surfaces has or will occur, pending USEPA approval, at the following facilities:

- Strawberry Mansion High School (encapsulation completed utilizing an epoxy encapsulant)
- Wanamaker Middle School (encapsulation completed utilizing an epoxy encapsulant)
- Girls High School (encapsulation completed utilizing an epoxy encapsulant)
- Northeast High School
- Randolph Skills Center (encapsulation completed using a new concrete floor)
- Overbrook High School
- South Philadelphia High School
- Central East Middle School (encapsulation completed utilizing an epoxy encapsulant)
- Roxborough High School

No encapsulation or remediation will be performed at facilities where no visual evidence of leakage exists.

4.2 Encapsulation Requirements

The encapsulant to be utilized when a new concrete floor is not installed over existing PCB contaminated concrete is an epoxy coating which is resistant to chemicals and abrasion. Prior to the application of the encapsulant, the floor surface will be prepared and primed to enhance adhesion of the encapsulant to the floor. The encapsulant, as well as the concrete primer, are manufactured by Stonehard, Inc. (Stonehard) of Maple Shade, NJ. Stonehard is the worlds largest manufacturer and installer of high performance polymer coatings.

The selected epoxy coating has been used by other companies which are involved with PCBs for the sealing of concrete floors which have been contaminated by PCBs. The areas being encapsulated within the schools are subject to infrequent foot-traffic and no mechanical abrasion. The School District intends to apply a single coat of the epoxy encapsulant, in a color which will contrast with the underlying concrete floor. In this manner, it will be visually apparent in the unlikely event that the epoxy material coating becomes degraded. The manufacturer does not recommend that a two-coat application be utilized.

Appendix C contains product data regarding the epoxy primer and the encapsulant.

Subsequent to the application and curing of the encapsulant, a single representative wipe sample will be taken from each facility, to confirm that the encapsulant is effective. A wipe sample of the encapsulated surface which contains a PCB concentration of less than 10 $\mu g/100\ cm^2$ will be considered adequate confirmation. The wipe sample will be taken from an area which was previously documented as having a PCB surface concentration exceeding the target value of 10 $\mu g/100\ cm^2$. (It is noted that following epoxy encapsulation of the PCB contaminated concrete at the Central East Middle School, two wipe samples of the encapsulated surface were taken. Both samples contained a non-detectable concentration of PCBs (laboratory limit of quantitation was 1 $\mu g/100\ cm^2$). Further information regarding the encapsulation and post-encapsulation sampling will be provided to USEPA in the Final Report for this location.)

4.3 Removal and Disposal Plan Associated with Encapsulation

In accordance with the requirements of the Consent Decree, for those locations where PCB transformers have been removed and encapsulation is performed or where a new concrete floor is installed over PCB contaminated concrete, The School District shall file and record a facility specific removal and disposal plan as a deed notification and restriction for that facility.

The removal and disposal plan shall identify the specific area(s) which have been encapsulated and the long term plan which is to be followed for the maintenance of the encapsulant. The deed notification and restriction will provide effective notification, to a subsequent purchaser of the facility, of their obligation to properly remove and dispose of the encapsulated concrete at the time that renovations or demolition of the facility enable the work to be performed.

Further information regarding The School District's long-term maintenance plan for the encapsulated areas, as well as the plan for the removal and disposal of contaminated materials, is provided in Sections 6.0 and 7.0 respectively.

5.0 Removal and Disposal of Concrete

5.1 Statement of Intent

PCB contaminated concrete, including epoxy coated contaminated concrete, will be removed from a substation within a facility at the time that all PCB transformers are removed from that facility. Additionally, PCB contaminated concrete will be removed from a location if renovation or demolition occurs that disturbs the contaminated material. However, no removal of contaminated concrete will occur if structural engineering considerations make removal infeasible.

PCB contaminated concrete will be disposed of in accordance with TSCA regulations.

5.2 Identification of PCB Contaminated Concrete

The data contained within the Pre-Cleanup Sampling Reports, as well as the additional sampling which will be performed as part of this Cleanup Plan, will delineate those areas which have a PCB concentration in excess of 10 $\mu g/100cm^2$. Where it is infeasible to remove PCB contaminated concrete, all accessible concrete which has a PCB concentration in excess of 10 $\mu g/100cm^2$ will be encapsulated as part of the implementation of this Cleanup Plan. The encapsulant will be either concrete or epoxy, as discussed in Section 4.

At each facility, the location of epoxy encapsulated concrete will be easily identifiable by the contrasting color of the epoxy coating (yellow) in comparison to non-epoxy coated concrete. In addition, near each transformer, a sign will be posted advising that the floor surface has been epoxy or concrete coated, and the surface coating is not to be removed, cut, drilled, or otherwise disturbed without the specific approval of The School District's PCB Coordinator. A scaled drawing of each area which has been encapsulated will be maintained by The School District's PCB Coordinator.

The existence and presence of encapsulated concrete will be discussed at each training session for School District employees as outlined within The School District's PCB Management Plan.

5.3 Removal of PCB Contaminated Concrete

Prior to the removal of any concrete surface, The School District shall conduct a structural engineering evaluation to determine the depth to which concrete can be safely removed. Concrete removal prior to demolition of a facility will only be performed if it can be accomplished without jeopardy to the structural integrity of the area, and if the removal action will result in the complete removal of PCB contaminated concrete.

PCB contaminated concrete will be removed by either scabbling, where the surface of the concrete will be abraded down to the depth of uncontaminated concrete, or by bulk removal methods.

Where scabbling is utilized, in the absence of structural engineering constraints regarding the depth of concrete which can be removed, removal of concrete will continue until wipe sampling confirms that the newly exposed concrete has a surface PCB concentration of less than 10 $\mu g/100cm^2$. Wipe sampling will be performed in accordance with the method outlined in Appendix B.

5.4 Disposal of PCB Contaminated Concrete

Refer to Section 7.0 of this document for a discussion regarding the disposal of wastes generated during the implementation of this Cleanup Plan.

6.0 Long Term Maintenance

The School District intends to encapsulate concrete floor surfaces which have a PCB content in excess of 10 µg/100 cm^2, with the possible exception of those facilities where PCB transformers are being replaced and where the concrete can be safely removed. The encapsulating material will ensure that persons are not exposed to PCB contamination and that PCB contamination is not spread through the facility.

Described below is the long term maintenance plan which The School District has adopted to ensure the continued integrity of the encapsulated surfaces.

6.1 Encapsulant Material

The epoxy encapsulating material which has been chosen, as described in Section 4.0, is both chemically resistant and abrasion resistant. Since the transformers are not located in high use areas, nor in chemically aggressive environments, there is no reason to believe that routine operations will impact upon the integrity of the encapsulation which has been performed.

The color of the epoxy material is yellow. This color was chosen to ensure that the areas which have been encapsulated with epoxy are easily recognizable in comparison to the gray of the concrete floor.

6.2 Encapsulant Failure Analysis

As the epoxy encapsulant has been or will be applied in areas that are not subject to either chemical attack or physical abrasion, long term service of this material is expected. However, to be conservative, The School District has performed an analysis of those scenarios which could develop which could compromise the effectiveness of the encapsulant. These scenarios include:

- Future cracking or spalling of the concrete surface.
- Intentional drilling of the concrete surface
- Peeling/deterioration of the epoxy coating.

As described below, each of these scenarios are addressed in the long term maintenance plan which The School District has adopted for those locations where an epoxy encapsulant has been utilized. These items are discussed in more detail below.

6.3 Long Term Maintenance Plan

The School District's Long Term Maintenance Plan for areas encapsulated with either epoxy or new concrete provides for documentation, training, and inspection.

6.3.1 Documentation

At the time that the encapsulation is performed, The School District will take pictures and develop scaled drawings to document the areas which have been encapsulated. These records will be maintained by The School District's PCB Coordinator.

6.3.2 Training

The subject of the use and purpose of the encapsulating material will be incorporated into the training curriculum which is described within The School District's PCB Management Plan.

The following subjects will be discussed during the training session:

- The reason that the encapsulant has been utilized.
- The "care and maintenance" of the encapsulant (basically, perform no action which will abrade the surface and no drilling, chipping or other marring of the surface).
- The visual inspection that is to be performed on the encapsulant material during the time that the weekly inspection of the PCB transformers are performed. The weekly inspection sheets (see Figure 6-1) have been revised to reflect this confirmation. For those facilities where the PCB transformers have been removed, but encapsulation has been used as a remedial measure, the PCB Coordinator, or designated alternative, will conduct quarterly visual inspections of the epoxy coating. The PCB Coordinator will maintain records of these quarterly inspections.
- Any deterioration of the encapsulant will be promptly reported to The School District's PCB Coordinator.

The revised training curriculum is summarized on Table 6-1.

6.3.3 Inspection

Visual inspection of the encapsulated areas is a critical component of The School District's long term plan for confirming the integrity of the encapsulated areas. As noted above, a visual inspection will be performed on the encapsulant material during the time that the weekly inspection of the PCB transformers are performed. For those facilities where the PCB transformers have been removed but encapsulation has been used as a remedial measure, the PCB Coordinator, or designated alternative, will conduct quarterly visual inspections of the epoxy coating. The PCB Coordinator will maintain records of these quarterly inspections. The quarterly inspection sheets have been modified to incorporate the visual inspection of encapsulated surfaces (see Figure 6-2).

Table 6-1
Training Curriculum
for Locations with PCB Transformers or Encapsulated Areas
The School District of Philadelphia

- PCB Transformers - "Where are they? Why are they subject to regulation?"
- Health Effects of PCBs
- Applicable Regulations
- Worker Safety
- Combustible Materials
- Marking
- Security
- Inspections
- Encapsulation
- Care of Encapsulated Areas
- Inspection of Encapsulated Areas
- Record Keeping
- Spills and Spill Response Procedures

Figure 6-1
The School District of Philadelphia
Weekly Transformer Inspection Log
for the Month of _____

School: _____
Building Engineer:_____

Transformers at this Location (list by Serial Numbers all transformers inspected:)

_____

Inspection		Doors Locked (Yes or No)	Labels in Place (Yes or No)	Any Leaks Observed (Yes or No)	Combustibles Present (Yes or No)	Encapsulated Area - Satisfactory (Yes or No)	Inspected by
Date	Time						
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
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26							
27							
28							
29							
30							
31							

Notes:

1. At the end of each month, send the completed form to:
   Marijane Hooven, PCB Coordinator
   Office of Environmental Management Services
   The School District of Philadelphia
   734 Schuylkill Avenue
   Philadelphia, PA 19146

2. All leaks or suspected leaks are to be reported immediately to The School District Dispatcher at 215-735-6666.

3. No combustible materials are to be stored within transformer vaults or enclosures. For transformers enclosed by metal fencing, no combustible materials are to be located within 20 feet of the transformers. Move combustible materials away from transformers immediately. Refer to Section 4.2 of the PCB Management Plan.

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Figure 6-2
The School District of Philadelphia

PCB Transformer
Quarterly Visual Inspection Log

School:_____ **Date of Inspection:**_____

Location:_____ **Inspection by:**_____

Transformer Serial Number*	Manufacturer*	Dielectric Type* (Tradename)	Dielectric Weight* (pounds)	Leakage Observed		Location of Leakage and Stained Areas	Estimated Amount of Fluid Leaked
				No	Yes		

* Nameplate data previously developed.

Visual Observations Regarding Labels and Combustibles

Are Combustile materials present? YES NO

(Combustible materials include, but are not limited to, paints, solvents, plastics, paper, and sawn wood. Combustible material must not be stored within a PCB Transformer enclosure (i.e., in a transformer vault or in a partitioned area housing a transformer); within 5 meters of a transformer enclosure, or, if unenclosed (unpartitioned), within 5 meters of a PCB Transformer [761.30 (a) (1) (viii)]. Materials used on a day-to day basis, would not be considered "stored combustibles" and consequently are not required to be moved. A PCB Transformer surrounded by a chain-link fence is not considered "enclosed" for the purpose of this requirement, and therefore, combustible materials must not be stored within 5 meters of the transformer.)

If combustibles are present, describe material and location:_____

Location of PCB Labels:

Each transformer YES NO
Enclosure YES NO
Access Doors YES NO

(All PCB transformers must be individually labelled. Additionally, the vault door, machinery room door, fence (including a chain-linked fence), hallway, or other means of access (other than grates and manhole colvers) to a PCB Transformer must be marked [761.40 (j) (1)].

Encapsulated Area

Present Condition Satisfactory YES NO Other (describe)_____

7.0 Waste Disposal

The performance of the tasks outlined within this Cleanup Plan will generate a variety of waste products, some of which are subject to regulation under 40 CFR§761. It is the intent of The School District, subject to acceptance criteria established by the operator(s) of TSCA incinerators, to dispose of all TSCA regulated wastes by incineration at a licensed disposal facility. In the event that TSCA regulated wastes are generated which are not suitable for disposal by incineration, they shall be placed into a TSCA permitted chemical waste landfill.

7.1 Anticipated Waste Products

The anticipated wastes which will be generated at the facilities during the implementation of this Cleanup Plan include:

- Transformers which are removed from service.
- Dielectric fluid from transformers which are drained prior to removal.
- Contaminated concrete flooring which is removed from service.
- Personal protective equipment.
- Cleaning materials, including rags, brushes, and containers.
- Sampling templates.
- Polyethylene sheeting.
- Spent cleaning and etching fluids.
- Unused cured epoxy.
- Empty cans of coating materials

7.2 Waste Disposal

7.2.1 TSCA Regulated Wastes

With the exception of containers which held the coating materials, all wastes generated during the implementation of this Cleanup Plan will be treated as a TSCA waste.

With the exception of the PCB electrical transformers which are removed from service and possibly demolition debris, all wastes will be contained within properly labeled 55 gallon drums which meet USEPA and DOT shipping requirements. Excluding drums which contain dielectric fluid drained from the electrical transformers, all drums containing PCB waste articles will remain on-site until the completion of remediation and sampling activities. Pending completion of all activities, or prior to one year from the date which wastes are first placed into a drum, the drums will be properly manifested and transported to a permitted TSCA disposal facility.

PCB electrical transformers, which are being replaced, will be removed from active service, prepared for shipment, and loaded onto a truck at the time that the transformers are removed from service. Drums containing dielectric fluid will also be transported to a licensed disposal facility at this time.

PCB contaminated concrete will be removed by either scabbling, where the surface of the concrete will be abraded down to the depth of uncontaminated concrete, or by bulk removal methods. It is anticipated that all waste concrete will be placed within properly labeled 55 gallon drums which meet USEPA and DOT shipping requirements. However, at the time that a facility is demolished, it may not be practical to place bulk contaminated concrete into shipping drums. At that time, the utilization of lined roll-off containers for the transportation of PCB contaminated concrete to a licensed TSCA permitted chemical waste landfill will be evaluated.

7.2.2 Non-TSCA Regulated Wastes

Any non-TSCA wastes generated during the performance of the Cleanup Plan will be disposed of as municipal solid waste. It is anticipated that non-TSCA regulated waste which will be generated include containers which held cleaning and encapsulating materials.

APPENDIX A
EVALUATION OF ALTERNATIVES - RANDOLPH SKILLS CENTER

KEATING Environmental Management, Inc.

July 14, 1997

KE NTBK/5385

Ms. Charlene Creamer
United States Environmental Protection Agency
TSCA Enforcement & TRI Section
3AT31
841 Chestnut Building
Philadelphia, PA 19107

RE: PCB Transformer Compliance Project
Randolph Skills Center

Dear Charlene:

The School District of Philadelphia is currently in the process of removing the electrical transformer from the Randolph Skills Center. The current transformer is a 1,500 KVA higher secondary voltage radial transformer which was manufactured by the General Electric Company. The transformer contains 520 gallons (approximately 6,800 pounds) of Pyranol dielectric fluid. Its replacement is an air-cooled (dry) transformer.

During The School District's July 1995 inspection of this transformer, dielectric fluid was observed to be slowly leaking from the bottom gate valve. In addition, an accumulated puddle of fluid (approximately 8" in diameter) was present on the concrete floor slab, directly below the valve. This puddle of accumulated fluid did not extend beneath the transformer, nor did it come in contact with the transformer skids. A larger area of oil staining (approximately 2' x 4') was also present on the northwest side of the primary switchgear. At the time of the initial inspection, it could not be determined if the transformer was the source of this stained area.

In response to the release of dielectric fluid, The School District repaired the leaking valve and initiated activities to remediate the areas of the concrete floor which were impacted by PCBs. A report on the remediation and subsequent wipe sampling was submitted to USEPA during November of 1997. That report was titled "PCB Transformer Compliance Project - Remediation/Assessment Results and Recommendations, Randolph Skills Center."

The School District has determined, based upon the findings contained in the above referenced report, coupled with the results from additional wipe sampling which has been performed within the transformer room, that the concentration of PCBs in wipe samples taken from many different locations exceed the cleanup criteria of 10 $\mu g/100\ cm^2$. Furthermore, The School District has concluded that additional attempts to clean the concrete is neither cost-effective or consistent with the objective of having the new, non-PCB transformer installed and operational with only a minimum amount of down-time.

ALTERNATIVE EVALUATION

The School District has evaluated a number of alternative solutions which address the PCB contaminated concrete. Consistent with the requirements of the Consent Decree between The School District and USEPA, these alternatives included both permanent and interim remedial solutions. The School District's preference is to utilize permanent solutions when they are cost-effective and when they can be implemented within the required schedule.

Permanent Remediation Solutions

Permanent solutions which were evaluated included:

1. The removal and replacement of the existing concrete floor within the transformer room.

2. The scabbling of PCB contaminated concrete from the floor within the transformer room.

3. The chemical removal of the PCBs from the concrete floor.

Our evaluation of each of these items are briefly summarized below.

Removal and Replacement of the Concrete Floor

The Randolph Skills Center building was originally constructed as a factory around 1948. The building is constructed of a reinforced concrete slab on grade beams which span between piles. A tunnel exists under the east side of the building. The transformer room is located partially above the tunnel. It has been determined that removal and replacement of the concrete slab (i.e. the floor of the transformer room) is not a structurally viable alternative, nor is it a cost-effective remedial measure which could be accomplished within a minimum time frame.

Scabbling of Contaminated Concrete

Attachment A to this letter provides a structural engineering evaluation associated with the removal, by scabbling, of contaminated concrete from the transformer room. As indicated in the evaluation, the top layer of reinforcing steel has 1" of concrete cover. To avoid damage to the underlying reinforcing steel within the concrete slab, scabbling would be permitted to a depth of only 3/4".

The School District anticipates that in excess of 3/4" of concrete may need to be removed to achieve the cleanup objective of 10 $\mu g/100\ cm^2$. (Concrete core sampling was performed within the transformer room at Roxborough High School. The results from Roxborough High School, while not conclusive, suggest contamination in excess of 50 ppm may exist at depths greater than 1/2"; reference Keating Environmental's "PCB Transformer Compliance Project, Pre-Cleanup Sampling Report, Roxborough High School; April 1997.)

Since there is not a high level of confidence that scabbling would achieve the cleanup objective, it was eliminated from further consideration.

Chemical Remediation Methods

A number of sources were contacted for current information regarding the effectiveness of bioremediation as well as chemical extraction of PCBs in concrete. No documentation of the success of either method on removing Arochlor 1260 from reinforced concrete was presented to Keating Environmental by technology suppliers.

At USEPA's request, on July 8, 1997, Keating Environmental contacted Ms. Christie Weisemsel of Union Camp regarding their experience using the Tech X-tract method of PCB extraction. Ms. Weisemsel provided the following information:

- The wipe sample with the highest initial PCB concentration at their facility was 1,424 µg/100 cm^2.
- Between 7-8 applications of the extraction chemical were required to reduce the surface concentration to less than 10 µg/100 cm^2. The time frame associated with these applications was in terms of weeks.
- Union Camp has not determined if the remediated concrete has bulk PCB concentrations which would enable it to be disposed in a non-TSCA facility.
- Approximately $102,000 was spent for remediation of approximately 360 square feet (30' x 12') of flooring at their facility.
- The Arochlor of concern at Union Camp was not known at the time of our discussion.

Our evaluation of this methodology notes that the wipe sample with the highest PCB concentration after cleaning at Randolph Skills Center was 21,000 µg/100 cm^2. This concentration is almost 15 times higher than the initial value at Union Camp. Therefore, we anticipate that an equal or greater number of extraction cycles would be necessary, with no assurance that the cleanup criteria of 10 µg/100 cm^2 could be achieved. Additionally, the area of concern at the Randolph skills Center is approximately 544 square feet (32' x 17'), significantly larger than the 360 square feet at Union Camp. We would anticipate, based upon Union Camp's cost data, that in excess of $100,000 would be spent on the X-tract method at Randolph Skills Center, with no guarantee that the USEPA cleanup criteria would be achieved. We believe that there are responsible, less expensive means for meeting the requirements of the Consent Decree.

Preferred Remedial Method

The Consent Decree does not mandate that contaminated concrete be removed at the time that a PCB transformer is replaced if it is "infeasible" due to structural engineering concerns. As developed within this letter, sufficient structural engineering concerns exist. The concrete can not be removed or adequately scabbled at this time.

As an interim remedial measure, The School District proposes to install a concrete slab directly above the existing PCB contaminated concrete slab. The new concrete slab will be a barrier which will preclude contact with the contaminated PCB concrete and will also prevent the spread of PCBs. The concrete slab will be reinforced to minimize the potential for cracking and will be no less than 2" thick. The concrete slab can be installed in a single day and represents a responsible, safe, cost-effective interim option for The School District. At the time that the Randolph Skills Center is demolished or renovation activities occur which would enable the contaminated concrete to be removed, the contaminated concrete will be disposed in accordance with applicable TSCA regulations. Consistent with Consent Decree requirements, suitable postings will be made in the facility and deed restrictions shall be submitted to the Recorder of Deeds for Philadelphia County.

The replacement of the PCB transformer at Randolph Skills Center is currently in progress. The School District has taken a pro-active position to the Consent Decree. The replacement of the PCB transformer at Central East Middle School has already been completed. The replacement of the PCB transformer at Hackett Elementary School is in-progress. The applicable Pre-Cleanup Reports have been submitted for all schools. Our proposal is consistent with the Consent Decree. To enable The School District to continue to proceed in an efficient manner, I would appreciate your concurrence regarding the use of a new concrete floor as an interim remedial measure at this location.

I would appreciate your contacting me upon your review of this correspondence.

Very truly yours,
Keating Environmental Management, Inc.

Keith Choper, P. E.

cc: Jackie Sparkman, Esquire
Ms. Marijane Hooven
Mr. Elwood Miller

Attachment: PSD's Mr. Steve Gatschet's 7/8/97 memo to MJ Hooven re: Randolph Transformer Slab

ATTACHMENT A

School District of Philadelphia - Design and Construction Services

Memorandum

Date: 08 July, 97

TERRY - FYI.

MT

To: Marijane Hooven

From: Steve Gatschet

Subject: Randolph Transformer Slab

Attached is Hunt Engineering's report and structural recommendations for the contaminated slab in the transformer room.

Please note that the recommendation to mill the slab originated with Mr. Terry McKenna, P.E. of the Keating Company. He believes that removal of an entire section of slab would take longer than milling and testing.

SG

Attachments: Hunt Engineering Field Report

Copies: Gene Becker
Angelo Perryman

FIELD REPORT

School: Randolph Skills Center
Henry and Roberts Avenues
School District of Philadelphia

Facility: Transformer Room

Site Visit: July 2, 1997
Scott Porreca, P.E., Hunt Engineering Company
Steve Gaschet, A.I.A., The School District of Philadelphia
Terry McKenna, Keating Environmental Management, Inc.

Background: The following information has been reported or made available for evaluating the structural integrity of the floor slab in the transformer room.

1.0 PCB remediation is currently being undertaken in the transformer room of the Randolph Skills Center. PCB contamination was found throughout the slab in the transformer room with the highest PCB levels occurring adjacent to the transformer.

2.0 The current plan for remediating the PCB's is to mill the concrete surface in increments of 1/8 to 1/4 of an inch in depth and perform a wipe test of the newly exposed concrete. If additional contamination is found, the slab will be milled again. This process will continue up to a 1 inch depth. If the slab is milled 1 inch and is still found to be contaminated, it will be encapsulated with epoxy paint.

3.0 Background information was obtained from on-site and telephone interviews and also from original construction drawings prepared by The Ballinger Company, dated April 12 and July 28, 1948.

3.0 The Randolph Skills center was originally constructed as a factory building about 1948. The footprint of the building measures approximately 312 feet by 430 feet. The building is constructed of a reinforced concrete slab on grade beams which span between pile caps. A tunnel was constructed under the east side of the building. The purpose of the tunnel is not known, however, it could have been constructed for utility piping and conduits.

4.0 The transformer room is located on the east side of the building approximately 100 feet north and 22 feet west of the southeast corner of the

building. The tunnel is present under the entire length of the eastern 5 feet of the transformer room.

5.0 Reinforcing steel in the concrete slab varies in the transformer room floor because of the transition over the tunnel wall. Drawing number 2369-202 dated April 12, 1948, indicates that, in general, the top layer of steel in the slab has 1 inch of cover.

6.0 Limited information regarding location, size, and weight of the new electrical equipment was available. From discussions with the electrical contractor, Eagle Industrial Electric, and the SDP the following information was obtained. The old transformer weighed 15,000 lb. The new transformer measures 84 inches by 68 inches and weighs 10,500 lb. The new high voltage switch measures 65 inches by 80 inches and weighs 2800 lb. A new distribution panel is also part of the new equipment.

7.0 Eagle Industrial Electric also stated that the slab elevation must remain the same so existing piping and conduit elevations would match the new equipment.

Observations: Field observations were made on July 2, 1997 by Scott Porreca.

1.0 The existing concrete slab in the transformer room appears to be in good condition. There are no cracks or other signs of distress in the slab.

2.0 The 10 inch wide tunnel walls have a 16 inch wide beam on the top supporting the first floor slab. All concrete elements are in good condition except the bottom corners of the beam have been slightly damaged. The bottom corners of the beam are chipped and spalled probably from workmen and equipment movement in the tunnel. Working conditions in the tunnel are cramped and corner damage is not uncommon in a 50 year old building.

Conclusions: Based on the foregoing information the following conclusions are offered:

1.0 The new equipment should not impose loads on the slab greater than the existing equipment. However, the full 8 inch slab needs to be present to accommodate the loads from the new equipment.

2.0 After milling, the top of the slab must be restored to the original elevation to accommodate Eagle Industrial Electric's requirements for the new equipment.

3.0 The cover over the reinforcing steel is 1 inch. During milling the contractor must take extreme care not to damage the reinforcing steel.

Recommendations: Based on the foregoing information and conclusions, the following recommendations are conceptualized:

1.0 The slab should only be milled a maximum of 3/4 of an inch to prevent damage to the reinforcing steel. If the reinforcing steel is exposed, the milling must cease in that location. If additional concrete is to be removed in an area with exposed reinforcing steel, a method shall be used which will not damage the exposed steel. If the reinforcing steel is damaged, the damage shall be reviewed by a structural engineer for corrective action. Possible corrective actions include removing the concrete from around the damaged reinforcing steel and sistering an additional piece of reinforcing steel next to the damaged piece.

2.0 Prior to the start of milling operations, the existing equipment should be removed from the concrete floor slab. The slab should not be subjected to heavy construction loading, concentrated loads, or to new equipment loads until a minimum of 3 days after placement of the new overlay.

3.0 After all milling has been accomplished, the slab should be prepared to receive the new overlay system. Preparation of the milled surface should include roughing the surface about 1/2 inch using 50 lb. chipping guns and, immediately before installing the overly, applying an epoxy adhesive similar to Sikadur 35, Hi-mod LV to the roughened surface.

4.0 The slab should be overlaid with a product similar to SikaTop Overlay System using SikaTop 111. All of the manufacturer's procedures and recommendations must be followed when installing the overlay system. The overlay system should be installed to restore the slab's original structural integrity and also to provide the correct elevation for the installation of the new electrical equipment.

5.0 If encapsulation of the slab is required after milling, the epoxy encapsulation paint must be applied after the slab has been restored to its original thickness of 8 inches. Applying the encapsulation paint to the milled concrete surface will compromise the integrity of the restored slab. Also, care must be taken to ensure that the epoxy encapsulation paint and the overlay system are compatible.

5385 File
KC/no KbK

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107-4431

JUL 25 1997

Mr. Keith Choper, P.E.
KEATING Environmental Management, Inc.
7 Great Valley Parkway
Suite 140
Malvern, Pennsylvania 19355

RE: PCB Transformer Compliance Project
Randolph Skills Center

Dear Mr. Choper:

This letter is in response to your correspondence dated July 14, 1997, regarding the polychlorinated biphenyl (PCB) remediation activities at the Randolph Skills Center of the School District of Philadelphia.

Your letter requested concurrence for the proposed alternative interim remedial measure to address the PCB contamination which exists at the Randolph Skills Center. Your letter states that the remediation activities that have already been performed do not reduce the PCB concentration to an acceptable decontamination level. Also, your letter indicates that KEATING has evaluated several other methods and technologies including, removal and replacement of the concrete floor, scarification, and chemical extraction. However, KEATING is concerned that those measures may affect the integrity of the building structure where the transformer is located, or the method was cost prohibitive. Your letter indicated that the alternative interim remedial measure preferred was to install a concrete layer directly onto the existing floor to create a barrier between the PCB contamination and the surface of the floor.

As stated in the Consent Decree between the United States Environmental Protection Agency (EPA) and the School District of Philadelphia Board of Education, interim measures are allowed in the Cleanup Plan of the schools. Specifically, Section V, Paragraph 8 b., decontamination/cleanup, allows the use of alternative interim measures when the removal of contaminated material will result in structural engineering concerns. In this particular instance, the use of another layer of concrete would be classified as an encapsulant. Please be advised that maintenance procedures of the encapsulant must be delineated, signs must be posted indicating that contamination remains in the area, and a Deed Restriction must be filed with the appropriate City and County offices notifying a subsequent purchaser of the property the extent of contamination. In consideration of the above requirements for the concrete encapsulant, the School District may proceed with the Cleanup Plan with the alternative interim measure. Please submit to our office the revised Cleanup Plan for the Randolph Skills Center incorporating the alternative interim measure.

Should you have any questions regarding this matter, please contact Ms. Charlene C. Creamer, of my staff, at 215/566-2145.

Sincerely,

John J. Ruggero, Chief
Toxics Enforcement Section

cc: D. Mastro (3RC11)
M. Hooven (PSD)
J. Sparkman (OGC, PSD)

APPENDIX B
WIPE SAMPLING PROCEDURE

Appendix B

Compliance with the cleanup criteria of the Consent Decree requires that wipe sampling be performed, and that the samples be properly analyzed.

All wipe sampling performed will be conducted in accordance with the USEPA guidance document entitled "Wipe Sampling and Double Wash/Rinse Cleanup As Recommended By The Environmental Protection Agency PCB Spill Cleanup Policy", dated 23 June 1987.

Wipe samples will be collected with a dedicated 3" x 3" sterile gauze pad. Prior to sampling, the intended sample area will be delineated with a pre-measured cardboard template. All sample areas will be equal to 100 cm^2 (10 cm x 10 cm). To collect the sample, the gauze pad will be moistened with 8 milliliters (ml) of pesticide grade hexane, and the delineated area wiped both vertically and horizontally to ensure complete surface coverage. Once wiping is completed, the gauze pad will be placed into a laboratory supplied 2 ounce jar, and a completed jar label and yellow TSCA PCB label will be attached to the jar. The jar will then be placed into a plastic zip-lock bag, and placed on ice to cool to less than 4°C. All information will be recorded in a field log book and on chain-of-custody forms.

In order to ensure of the quality of the chemical data generated, both a blind duplicate sample and a field blank will be collected and analyzed for the assessment sampling. Collection of a blind duplicate sample will provide for the evaluation of the laboratory's performance by comparing analytical results of two samples from adjacent areas. For the purpose of wipe samples, a blind duplicate sample will be collected directly adjacent to the 100 cm^2 area of the primary sample. One blind duplicate sample will be collected for each 20 primary samples submitted for laboratory analysis. Collection of a field blank provides for the evaluation of possible contamination of samples due to ambient conditions and bottle cleanliness. The wipe sample field blank will be collected by pouring 8 ml of pesticide grade hexane on a gauze pad, at the location of the assessment sampling activities. The moistened pad will then be placed into a laboratory supplied 2 ounce jar and handled/analyzed in the same manner as the primary samples. A minimum of one field blank will be collected per sampling episode.

Prior to the performance of any wipe sampling, if the area to be sampled appears to be covered by particulate matter (i.e. dust), the particulate matter will be removed.

All wipe samples will be analyzed for their PCB content by a certified laboratory using USEPA Method 8080, modified for wipe sample analysis.

APPENDIX C
PRIMER AND ENCAPSULANT DATA

STANDARD PRIMER

PRODUCT DATA

STONHARD

DESCRIPTION

Stonhard STANDARD PRIMER is a two-component epoxy based priming system. It is applied to a properly prepared surface prior to the application of the appropriate Stonhard overlayment. The use of Stonhard STANDARD PRIMER ensures a secure bond between the substrate and overlayment, reduces absorption of the overlayment's liquids (epoxy resin/curing agent) and makes the application of the overlayment easier.

USES

Stonhard STANDARD PRIMER is designed for use with STONCLAD GS, STONCLAD PT, STONSHIELD HRI BASE and other Stonhard flooring systems. See the PRIMER SELECTION GUIDE for the appropriate selection.

PACKAGING

STANDARD PRIMER is supplied in pre-measured units to eliminate on-site measuring errors. Each unit consists of one carton containing:

- 6 foil bags of Part A (curing agent)
- 6 poly bags of Part B (resin)

COVERAGE

One unit of STANDARD PRIMER will cover approximately 600 sq ft/55.75 sq m of relatively smooth surface.

A batch of STANDARD PRIMER is made up of one foil bag of Part A and one poly bag of Part B. Each batch will cover approximately 100 sq ft/9.29 sq m.

Since each batch has been proportioned to cover a specific area, the installer should make certain that each single batch is NOT used to cover a larger area. Also, on very rough surfaces, a batch of STANDARD PRIMER may not cover a full 100 sq ft/9.29 sq m. The rougher the surface, the less total area a batch will cover. It is important to get complete coverage without leaving "pools" of STANDARD PRIMER material in depressions.

STORAGE CONDITIONS

Store both components of STANDARD PRIMER at or above 60°F/16°C in a dry area. Avoid excessive heat. Do not freeze. The shelf life is 1 year in the original, unopened container.

SUBSTRATE PREPARATION

Proper preparation is critical to ensure an adequate bond. The substrate must be dry and free of all wax, grease, oils, fats, soil, loose or foreign materials and laitance. Laitance and unbonded cement particles must be removed by mechanical methods, i.e., abrasive blasting or scarifying. Other contaminants may be removed by scrubbing with a heavy duty industrial detergent (Stonkleen DG9) and rinsing with clean water. The surface must show open pores throughout and have a sandpaper texture. For recommendations or additional information regarding substrate preparation, please contact Stonhard's Technical Service Department.

MIXING

NOTE: Do not start mixing until the surface is properly prepared and dry, with the temperature of both the STANDARD PRIMER and the surface at least 60°F/16°C. Empty the contents of Component B (resin) and Component A (curing agent) into a clean mixing container. Mix with a slow speed drill and Jiffy Mixer for 1-1/2 to 2 minutes.

POT LIFE

After mixing, STANDARD PRIMER has a working time of approximately 45 minutes at 77°F/25°C. The working time may vary depending on ambient conditions.

APPLICATION

STANDARD PRIMER may be applied by rubber squeegee, brush or roller (medium nap). It is important to obtain the proper coverage and not allow the material to puddle in holes or depressions. Application of the appropriate Stonhard overlayment must be completed BEFORE the primer hardens. If the primer hardens before the overalyment is applied, the area must be reprimed. The "open time" for STANDARD PRIMER is approximately 3 hours at 77°F/25°C.

RECOMMENDATIONS

- Minimum ambient surface temperatures are 60°F/16°C at time of application.
- Apply only to a clean, sound and properly prepared surface.
- Clean tools immediately with either scouring pads and water, or mineral spirits. Hardened material will require mechanical removal.

PRECAUTIONS

Both liquid components A and B are skin and eye irritants; avoid contact. The use of a NIOSH/MSHA approved respirator, safety goggles and impervious gloves is recommended.

In case of contact, flush area with water for 15 minutes and seek medical attention. Wash skin with soap and water.

Use only with adequate ventilation.

NOTES

- Material Safety Data Sheets for STANDARD PRIMER are available upon request.

A staff of technical service engineers is available to assist in application, or answer questions related to Stonhard products.

Requests for technical literature or service can be made through local sales representatives and offices or corporate offices located throughout the world.

9/96
Rev. 10/94

STONHARD

Stonhard, Inc., U.S.A. 1-800-257-7953
Stonhard, Ltd., Canada 1-800-263-3112
Stonhard Latin America (52)-5-563-9900
Stonhard Europe (32)-2-720-8982
Stonhard Asia (63)-2-843-6011

STONKOTE HT4

PRODUCT DATA

STONHARD

PRODUCT DESCRIPTION

Stonkote HT4 is a two-component, 100% solids, epoxy coating. It is specifically formulated to provide outstanding protection from a wide range of chemicals while increasing abrasion resistance and cleanability. Stonkote HT4 is easily applied and hardens to an attractive gloss finish.

TYPICAL USES, APPLICATIONS

Utilizing its exceptional chemical properties, Stonkote HT4 provides an excellent protective coating for enhancing the chemical and abrasion resistance of any Stonhard flooring system. Stonkote HT4 also exhibits outstanding cleanability with an attractive appearance.

PRODUCT ADVANTAGES

- 100% solids
- Long term abrasion and corrosion resistance
- Excellent bond strength assures good adhesion
- Protects against moisture penetration
- Easy to apply to vertical and horizontal surfaces
- Durable, gloss finish permits easy cleaning and maintenance
- Factory proportioned packaging ensures consistent high quality and simplified mixing.

PACKAGING

Stonkote HT4 is supplied as a pre-measured unit to eliminate onsite measuring errors. Each unit consists of:

carton containing:
- 1 foil bag of Part A (curing agent)
- 1 polybag of Part B (resin)

COVERAGE

Approximately 200 sq ft/18.58 sq m per unit at 4 - 5 mils thickness over a porous substrate.

STORAGE CONDITIONS

Store both components of Stonkote HT4 at 60°F/16°C in a dry area. Avoid excessive heat and do not freeze. The shelf life is one year in the original, unopened container.

PHYSICAL/CHEMICAL CHARACTERISTICS

Percent Solids	100%
Pot Life @ 77°F/25°C	35 minutes
Suggested Number of Coats	One
Theoretical Coverage @ 4.0 mils (DFT)	200 sq ft/18.58 sq m
Cure Rate @ 77°F/25°C	4-5 hours for tack free surface 24 hours minimum for normal operations
Temperature Limitations	200°F/93°C continuous exposure 250°F/121°C intermittent exposure
Fire Resistance of Dry Film	Self Extinguishing

COLOR

Stonkote HT4 is available in clear and 15 standard colors. Custom colors are available upon request. Please refer to the Stonhard Coatings Color Selection Guide.

SURFACE PREPARATION

Preparing Stonhard Flooring Systems

Before coating a Stonhard floor, all trowel marks and surface imperfections must be removed to produce a smooth surface. Grind the floor using a floor grinder with medium stones and vacuum using an industrial wet/dry vacuum to remove all dust particles. The Stonhard floor is now ready to be coated with Stonkote HT4.

Preparing Concrete Substrate

Proper preparation is critical to ensure an adequate bond. The substrate must be dry and free of all wax, grease, oils, fats soil, loose or foreign materials and laitance. Laitance and unbonded cement particles must be removed by mechanical methods, i.e., abrasive blasting or scarifying. Other contaminants may be removed by scrubbing with a heavy duty industrial detergent (Stonkleen DG9) and rinsing with clean water. The surface must show open pores throughout and have a sand paper texture. For recommendations or additional information regarding substrate preparation, please contact Stonhard's Technical Service Department.

PRIMING

For use over a Stonhard floor, no primer is necessary. For use over a concrete substrate, Stoncrest GS3 or Standard Primer is recommended to ensure maximum product performance.

PRODUCT MIXING

Stonkote HT4 is supplied in factory proportioned quantities. To achieve thorough and proper mixing, the Stonkote HT4 must be mechanically mixed using a heavy-duty, slow speed drill (400-600 rpm) with a Jiffy Mixer. Pour the contents of Part B into a mixing container and pre-mix to assure the suspensions of solids. Add Part A and continue to mix to a uniform consistency for 1-2 minutes. Avoid high-speed mixing that will entrain air into the mix. Thorough mixing of the two components is mandatory.

POT LIFE

After mixing, Stonkote HT4 has a working time of approximately 35 minutes at 77°F/25°C. The working time may vary depending on ambient conditions.

APPLICATION

Stonkote HT4 can be applied at ambient temperatures of 60-85°F/16-30°C and humidity below 80%. The HT4 must be applied immediately after mixing the two components. Stonkote HT4 is applied with a rubber squeegee and short nap roller. The roller is used to remove squeegee lines and smooth out the surface. A brush may be used where necessary. Stonkote HT4 may be applied at a variable thickness ranging from 4 to 6 mils minimum dry film thickness. Each additional coat may be applied when the surface is tack free which is about 4-5 hours. Any questions regarding the application of Stonkote HT4 should be directed to Stonhard.

CURING

The surface of Stonkote HT4 will be tack free in 4-5 hours at 77°F/25°C. The coated area may be put back in service in 24 hours. Ultimate physical characteristics will be achieved in seven days.

RECOMMENDATIONS

- Apply only on a clean, sound and properly prepared substrate.
- Minimum ambient and surface temperatures are 60°F/16°C at the time of application.
- Do not use water or steam in the vicinity of the application. Moisture can seriously affect the working time and properties of the material.
- Application and curing times are dependent upon ambient conditions.

PRECAUTIONS:

- Toluene and Xylene solvents are recommended for clean up of the unreacted Stonkote HT4 material. The reacted material will require mechanical means of removal. Use these materials only in strict accordance with manufacturers' recommended safety procedures. Dispose of waste materials in accordance with Government Regulations.
- The use of NIOSH/MSHA approved respirator, safety goggles and impervious gloves is recommended.
- In case of contact, flush area with water for 15 minutes and seek medical attention. Wash skin with soap and water.
- Use only with adequate ventilation.

NOTES

- For environments not referenced in the Chemical Resistance Guide, please consult Stonhard for recommendations.
- Material Safety Data Sheets on Stonkote HT4 are available on request.
- A staff of technical service engineers is available to assist in product application, or answer questions related to Stonhard products.
- Requests for technical literature or service can be made through local sales representatives and offices or corporate offices located throughout the world.